

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-12 (Withdrawn)

13. (New) A back pressure valve, comprising:

(a) a first housing including a first chamber formed therein having an inlet and a fluid outlet for a first fluid;

(b) a second housing including a second chamber formed therein;

(c) a flexible diaphragm having an outer peripheral edge portion abutting the second housing and closing off the second chamber;

(d) a back pressure member moveably disposed in the first chamber of the first housing for controlling fluid flow between the fluid inlet and the fluid outlet, wherein the first chamber is defined by the first housing and the back pressure member; wherein the flexible diaphragm is fixed onto and moveable together with the back pressure member, whereby pressure in the second chamber determines fluid pressure required to maintain the back pressure member in a steady position; and

(e) a reference inlet and a reference outlet, for a reference fluid, provided in the second housing, and a control valve means in the second housing connected to the reference inlet and the reference outlet, for controlling the pressure in at least part of the second housing applied to the flexible diaphragm and the back pressure member.

14. (New) A back pressure valve as claimed in claim 13, that includes at least one pressure controlling device connected to the control valve means.

15. (New) A back pressure valve as claimed in claim 14, that includes a processor connected to the pressure controlling device.

16. (New) A back pressure valve as claimed in claim 15, that includes a pressure transducer, for measuring pressure downstream of the outlet for the first fluid, and connected to the processor, to provide feedback on the downstream pressure.

17. (New) A back pressure valve as claimed in claim 13, wherein the control valve means comprises a reference inlet valve for controlling flow of the reference fluid into the second chamber and connected to the reference inlet, and a reference outlet valve connected to the reference outlet for controlling flow of the reference fluid out from the second chamber.

18. (New) A back pressure valve as claimed in claim 17, wherein the reference inlet and outlet valves are mounted on a member separate from and mounted on the second housing.

19. (New) A back pressure valve as claimed in claim 18, wherein said member comprises a gas dome, and wherein the second housing includes an end wall on which the gas dome is mounted.

20. (New) A back pressure valve as claimed in claim 19, wherein the end wall separates another chamber from the second chamber, with the first and second valves being located in the other chamber.

21. (New) A back pressure valve as claimed in claim 20, wherein the second housing includes a through hole in the end wall, and wherein the gas dome is mounted on the end wall closing off the through hole.

22. (New) A back pressure valve as claimed in claim 21, wherein the gas dome includes a flange portion abutting the end wall, the end wall and the flange portion each include at least one hole permitting reference gas to flow from the reference gas inlet to the reference inlet valve, the flange portion includes at least one hole permitting the reference gas to flow from the reference inlet valve to the interior of the gas dome and at least one hole permitting the reference gas to flow out from the interior of the gas dome to the reference outlet valve, and the flange and the flange portion each include at least one hole permitting the reference gas to flow from the reference gas outlet valve to the reference gas outlet.

23. (New) A back pressure valve as claimed in claim 22, wherein the dome includes a hollow cylindrical portion, with the flange portion provided around the hollow cylindrical portion.

24. (New) A back pressure valve as claimed in claim 13, wherein the back pressure member is moveable to a closed position in which the back pressure member seals off the passage between the fluid inlet from the fluid outlet.

25. (New) A back pressure valve as claimed in claim 24, wherein the first chamber includes a bore, wherein the fluid inlet and the fluid outlet open into the bore, and wherein the back pressure member is slidably mounted in the bore for movement within the bore.

26. (New) A back pressure valve as claimed in claim 25, which further comprises a sleeve member disposed within the first housing and providing said bore for the back pressure member, the sleeve member being fixed onto the first housing and having an opening that is closed by the back pressure member in the closed position and that permits the fluid to flow from the fluid inlet to the fluid outlet when the back pressure member is in an open position.

27. (New) A back pressure valve as claimed in claim 26, further comprising a holding means attached to the flexible diaphragm and holding the back pressure member to the diaphragm, whereby the back pressure member and the diaphragm are moveable together.